Fire Weather Services for Southeast North Carolina

Operating Plan

NWS Wilmington, North Carolina
Revised February 2004

This operating plan will be a semi-permanent document, specifying services provided by the National Weather Service in Wilmington, North Carolina. The plan incorporates procedures detailed in the National Agreement for Meteorological Services in Support of Agencies with Land Management and Fire Protection Responsibilities.

Operating Plan for Fire Weather Services
for
Southeast North Carolina

February 2004

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National Oceanic and Atmospheric Administration
National Weather Service
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I. INTRODUCTION

Weather support for forestry operations in southeast North Carolina is provided by the NWS office in Wilmington, North Carolina. This includes routine daily forecasts, spot weather forecasts, and forecasts of Red Flag events for the area.

I.A Purpose

This Operating Plan is issued in lieu of a formal local Memorandum of Understanding (MOU) between the NWS Wilmington and the federal, state, and local land management agencies that rely on weather support for routine and emergency operations. This plan outlines NWS operations and services available to users including products and formats, dissemination and coordination, and the responsibilities of the users.

I.B Objective

The Fire Weather Program at NWS Wilmington aims to provide weather support to land management agencies for use in wildfire suppression, fire presuppression activities, and planning and training related to these functions. The goal of this support is the protection of life and property as well as the reduction of the loss of natural resources caused by the adverse impact of weather on fire behavior.

This Operating Plan will be the governing document for fire weather procedures and cooperation between the following agencies:

NWS Weather Forecast Office Wilmington, North Carolina
National Park Service
U.S. Fish and Wildlife Service
North Carolina Forest Service

This Operating Plan for Fire Weather Services conforms with the Interagency Agreement for Meteorological Services, concluded in October of 2003. The National Agreement can be found in Appendix A.

The Southern Area Mobilization Guide and the National Mobilization Guide further define the relationship between the wildland fire agencies and the NWS Incident Meteorologist.

I.C Partners, Customers, and Users

Partners, Customers, and Users shall be defined as any person, group, agency, or body which uses the products and services provided by the NWS in support of fire operations.

II. SERVICE AREA AND ORGANIZATIONAL DIRECTORY

II.A Fire Weather Forecast Area

NWS forecast areas are tied to the "radar umbrella" of the WSR-88D Doppler Radar. The umbrella is the area covered by the radar volume scan. This means that forecasts issued by the NWS are not bound by state political boundaries, although county borders are generally observed.

The WFO Wilmington, NC forecast area covers southeast North Carolina and northeast South Carolina. A map of the area for which NWS Wilmington will issue Fire Weather forecasts is in Appendix C.

The counties in North Carolina covered by WFO Wilmington, NC include:

Bladen	Brunswick	Columbus	New Hanover
Pender	Robeson		

National Parks covered by the WFO Wilmington, NC:
Moores Creek National Battlefield

U.S. Fish and Wildlife National Wildlife Refuges covered by the WFO Wilmington, NC:
Waccamaw NWR

II.B Orgazinational Directory

II.B.1 National Weather Service Headquarters

NWS Headquarters, located in Silver Spring, Maryland, establishes policies and coordinates the national fire weather program. The national program manager coordinates the program with the regional program managers. The national program manager also works with the national headquarters of the federal forestry and land management agencies as well as the Association of State Foresters in determining overall forestry and land management requirements for meteorological support. The national program manager coordinates national training in forestry and fire weather for NWS forecasters.

II.B.2 National Weather Service Regional Headquarters

Regional Headquarters manage the technical operational aspects of the fire weather program within each region. They also provide guidance and assistance to meteorologists-in-charge (MIC) on program operations and problems through Supplements to the National Directives System (NDS) and conferences. Regional Headquarters advise NWS Headquarters on matters pertaining to technical planning and operations. The regional program managers coordinate regional fire weather programs and advise the Regional Directors on the operational and administrative aspects of these

programs.

II.B.3 Weather Forecast Office (WFO)

WFOs prepare and disseminate forecast products for all sectors of the population, including those for the Fire Weather program. These offices are responsible for providing forecasts to user agencies within their County Warning and Forecast Area (CWFA). Most offices have a designated fire weather program leader. A list of organizational contacts is in Appendix B.

II.B.3.a Meteorologist-in-Charge (MIC)

The MIC is responsible for the provision of adequate forestry and fire weather services in the office's assigned area of program responsibility. The MIC will ensure that the program leader is provided adequate time for user liaison and assistance activities.

II.B.3.b Fire Weather Program Leader (PL)

Fire weather program leaders (also known as focal points) are the customer service representatives for the program. Acting as the representative of the MIC, the PL will be in regular contact with land management agencies to help them assess meteorological needs, to inform them of NWS products and services available to meet these needs, and to educate them in the most effective use of the various NWS products and resources, including NOAA Weather Radio (NWR). PLs will work with users to aid them in utilizing existing NWS products and services produced for other programs that could meet the requirements of wildland management. The PLs are also tasked with ensuring staff meteorologists are trained and maintain proficiency in preparing forecast products in support of the fire weather program.

II.B.3.c Contact Information

The NWS WFO in Wilmington, North Carolina will provide fire weather services 24-hours a day, 365 days per year. WFO Wilmington, NC can be reached at:

National Weather Service
2015 Gardner Drive
Wilmington, NC 28405

Michael Caropolo, Meteorologist-in-Charge
John Quagliariello, Fire Weather Program Leader

Internet web site: http://www.erh.noaa.gov/ilm

Phone: 910-762-4289 (Note: an unlisted coordination number is available upon request)
Fax: 910-762-1288

III. SERVICES PROVIDED BY THE NATIONAL WEATHER SERVICE

III.A Fire Weather Season

Traditionally, the fire weather season over the eastern Carolinas is split into two seasons. The first of these extends from late winter through the time of full greening in the spring. The second occurs during the relatively dry fall months as leaves fall from the trees. However, pre-suppression fire weather forecasts will be prepared year round by WFO Wilmington, NC.

III.B Basic Services

III.B.1 Pre-suppression Forecasts

The pre-suppression forecast is a general forecast prepared twice daily by the duty forecaster and issued by 830 AM and 400 PM. The pre-suppression forecast covers 6 counties in southeast North Carolina and 8 counties in northeast South Carolina. This geographic area encompasses portions of North Carolina Forest Service Districts 6 and 8, Moore's Creek National Battlefield, and the future Waccamaw National Wildlife Refuge. The pre-suppression forecast is used for day-to-day planning of land management operations and for determining general weather trends which might impact fire behavior.

The pre-suppression forecast will follow the format established by the Eastern Region of the National Weather Service with modifications agreed to by land management agencies in North Carolina. The forecast will forecast values for all of the following weather elements: sky conditions; maximum and minimum temperatures; minimum and maximum relative humidity values; wind speed and direction; probability of precipitation; precipitation type, duration and amount; mixing heights; transport wind; ventilation and smoke management levels; wind profiles (from March 1 through May 31); and a stability index. The forecast values will reflect the duty forecasters expectation of the most probable weather conditions. Sample morning and afternoon pre-suppression forecasts are displayed in Appendix D.

The pre-suppression forecast will be divided into meteorologically similar zones such that the zone groupings may vary on a day-to-day basis. The office forecast philosophy will be to group the zones to reflect the expected weather conditions and not to reflect political boundaries.

III.B.1.a Pre-suppression Forecast Content

The pre-suppression forecast will provide a weather discussion and complete fire weather parameters for the first three periods in the morning forecast and the first four periods in the afternoon forecast. The morning forecast will cover today, tonight, and tomorrow (day 2) while the afternoon forecast will cover tonight, tomorrow, tomorrow night, and the next day (day 2). For the purposes of the presuppression forecast, the daytime periods are defined as 6 AM to 6 PM EST and the nighttime period is defined as 6 PM to 6 AM EST. One hour should be added to the above times during EDT.

Headlines

Headlines may be included at the beginning of the pre-suppression forecast or at the beginning of any of the zone groupings. Headlines may be included for expected changes in the weather, significant forecast problems (IE., dryness, heat, etc), and non-fire weather advisories, watches, and warnings. Headlines for Fire Weather Watches and Red Flag Warnings will be included in the pre-suppression forecast. In addition, headlines for emergencies declared by state or local agencies will be included upon request. An example would be Burning Bans.

Discussion

The DISCUSSION section of the forecast will be a general discussion of weather features expected to affect the area through 7 days. The discussion will be more detailed within 48 hours and become more general in the three to five day range. The discussion should contain information highlighting weather conditions, features, or changes important to fire behavior. Some examples of the type of information that may be included are frontal passages, wind shifts, extreme heat, extreme dryness, strong winds, and thunderstorm formation.

Wind profile analysis

Wind profile analysis information will be provided on a seasonal basis in the months of **March, April and May** or during times of high fire danger when requested by any of the user agencies listed in section I.2. A strong low level jet (wind speed maximum) can adversely affect fire behavior. The wind profile analysis will state whether the profile is FAVORABLE, QUESTIONABLE, or UNFAVORABLE. A FAVORABLE wind profile forecast indicates expected conditions that **are** favorable for burning. If the wind profile forecast is FAVORABLE, no other information will be provided. An UNFAVORABLE wind profile forecast indicates expected conditions that **are not** favorable for burning . If the profile is UNFAVORABLE, a profile type from Appendix E will be assigned. In addition, the maximum wind speed, direction, and height will be given. A QUESTIONABLE wind profile forecast indicates expected conditions appear to be unfavorable for burning but that more analysis is needed. If the forecast profile is QUESTIONABLE, an update will be issued once it is determined if the profile is FAVORABLE or UNFAVORABLE. This update will generally be issued by 11 AM local time.

CLOUD AMOUNT

The Cloud Amount will reflect the most probable sky conditions expected in the zone grouping during each period. The following terms will be used to describe sky conditions:

Weather Code (WX)	**Definition**
CLR	Clear skies
MO CLR	1/10 to 3/10 opaque cloud cover
PT CLDY	4/10 to 7/10 opaque cloud cover
MO CLDY	8/10 to 9/10 opaque cloud cover
CLDY	10/10 opaque cloud cover

PRECIP CHC (%)

The chance of precipitation is expressed as a percentage to the nearest 10 percent, ranging from 0 to 100 percent.

PRECIP TYPE

The Precip Type will reflect the most probable precipitation type expected in the zone grouping during each period. If the PRECIP CHC is less than 20 percent, NONE will be forecast. The following terms will be used to describe expected weather:

PRECIP TYPE	**Definition**
NONE	No precipitation or only isolated precipitation
DRIZZLE	Drizzle - Trace amount of precipitation
RAIN	Rain
SHOWERS	Rain showers
TSTMS	Thunderstorms
FRZ RAIN	Freezing Rain
SLEET	Ice pellets
SNOW	Snow
RAIN/SNOW	Rain/Snow mix
FRZ DRZL	Freezing Drizzle

MAX/MIN TEMP

Forecast temperatures will reflect the expected maximum daytime temperature and the expected minimum nighttime temperature. Typically, the maximum temperature occurs during the mid to late afternoon while the minimum temperature occurs just before sunrise. There will be times when the temperature does not follow this normal pattern. When this is expected to occur, it will be noted in the REMARKS section of the forecast and may also be noted in the DISCUSSION section of the forecast.

20FT WINDS AM/PM (MPH)

Wind forecasts will be comprised of expected wind direction and sustained wind speed. During daylight periods, a morning wind (AM WIND) and afternoon wind (PM WIND) will be included in the forecast. Wind direction forecasts will be to 16 points of the compass and reflect the direction from which the wind is blowing. Wind speed forecasts will reflect the maximum sustained 20 foot, two (2) minute average wind speed expected in miles per hour (mph) during the forecast period. Land managers need to be aware that wind reduction factors will need to be applied locally to determine eye level, and/or mid flame winds. If significant wind gusts or wind shifts are expected, it will be noted in the REMARKS section of the forecast and may be noted in the DISCUSSION section of the forecast.

PRECIP AMOUNT

The amount of precipitation expected during the 12 hour forecast period. Regardless of the PRECIP TYPE, forecast precipitation amounts are always liquid water amounts. PRECIP AMOUNT will only be forecast when the PRECIP CHC is 50 percent or higher.

PRECIP DURATION

The amount of time during the 12 hour period that precipitation is expected. The duration time represents the total number of hours precipitation will fall during the forecast period. Like PRECIP AMOUNT, PRECIP DURATION will only be forecast when the PRECIP CHC is 50 percent or higher.

HUMIDITY (%)

Forecast relative humidity values will reflect the expected minimum daytime relative humidity and the expected maximum nighttime relative humidity. Typically, the minimum daytime relative humidity occurs during the mid to late afternoon while the maximum nighttime relative humidity occurs just before sunrise.

Davis Stability Index (DSI)

Atmospheric stability will be forecast for the layer from the surface to approximately 5,000 feet. The forecast value will apply to the afternoon hours. The stability indices and their characteristics are listed below:

1 = STABLE - temperatures aloft decreasing with altitude at a rate of less than 3.5 degrees F per 1,000 feet (6.4 degrees C/km).

2 = CONDITIONALLY UNSTABLE - temperature decreases with altitude at the rate of 3.5 degrees F to 5.4 degrees F per 1,000 feet (6.4 to 9.7 degrees C/km) . Conditionally unstable air tends to become unstable if forced to rise. Additional heat, such as a fire, supplied at the surface can be sufficient to produce the needed rise.

3 = UNSTABLE - temperature decrease with altitude of 5.5 degrees F per 1,000 feet (9.8 degrees C/km).

4 = ABSOLUTELY UNSTABLE - temperature decrease with altitude greater than 5.5 degrees F per 1,000 feet (9.8 degrees C/km).

Smoke Dispersion and Inversion Information

Inversion related information (INVERSION) will be forecast for all forecast periods of the forecast. Mixing height (MIXING HGT), transport winds (TRANSPORT WIND), and ventilation rate (VENTILATION RATE) will be forecast for the daytime periods only.

Inversions will be forecast under the INVERSION header if expected below 1000 feet. If expected during the daytime period, a burn off time and temperature will be included. If the inversion is expected to persist all day, "CONTINUED" will be forecast. For the nighttime period, the onset time will be forecast unless the inversion is "CONTINUED" from the daytime. If no inversion is forecast, "NONE" will be inserted under INVERSION for the nighttime period. All times will be local time.

Mixing height (MIXING HGT) forecasts will be given to the nearest 100 feet. Transport winds (TRANSPORT WIND) will be forecast to the nearest 1 mile per hour (mph) with an 16 point wind direction denoting from which direction the winds are expected to blow.

Ventilation rate (VENTILATION RATE) will be forecast in units of ft-mph. To compute the applicable burn category for the area, users can consult the reference table attached to the end of the forecast. See Appendix D for sample forecasts and the included tables.

Smoke dispersion will not be directly forecast due to differences in wind tables governing the forecast for North Carolina and South Carolina. Users in North Carolina can consult the conversion table which will be provided at the end of the forecast (See Appendix D).

Remarks

The remarks section will contain any information necessary to further clarify the forecast. Possible examples include wind shift information, more detailed inversion information, and precipitation timing information.

Extended Forecast

The extended forecast will be a general forecast of expected weather covering the period from the day 2 night period through seven days out in time. The extended forecast will include a temperature forecast and precipitation forecast. If no precipitation is expected, no precipitation descriptors will be included in the extended. Instead, forecast sky conditions may be included.

Day 3 to 5 Wind Forecast

Winds for days 3 through 5 will be included in the FWF. If winds less than 15 mph are expected, the forecast will state this. For winds 15 mph or more, the wind direction will be included in the forecast.

The 8 to 14 Day Outlook

The 8 to 14 day outlook will cover day 8 through day 14 from the day the forecast is issued. The forecast will be a general outlook of expected temperature and precipitation in relation to climatological normals.

III.B.2 Site-Specific (Spot) Wildland Fire Forecasts

Spot forecasts are special, non-routine forecasts prepared upon request of any federal agency (or state agency where some aspect of federal resources are involved and/or interagency protection agreements currently exist) that needs site specific weather forecasts for: 1) controlling the spread of wildfire; 2) planning and managing prescribed fires; or 3) other specialized forest management activities. In the event of an emergency which threatens life and/or property, spot forecasts can also be provided to any federal, state, or local agency.

Spot forecasts are highly detailed forecasts prepared for a specific location within the forecast area. The forecasts may contain any or all of the following weather elements: sky conditions; maximum and minimum temperatures; minimum and maximum relative humidity values; wind speed and direction; probability of precipitation; precipitation type, duration and amount; mixing heights; transport wind; inversion height; inversion onset and burn off times or temperatures; ventilation and smoke management levels; wind profiles; stability indices (IE., Haines Index) and lightning activity levels (LAL).

III.B.2.a Requests for Spot Forecasts

Spot forecasts will be prepared when requested by a user agency. Federal, state, and local agencies may request spot forecasts in support of wildfire suppression or other emergencies where lives and/or property may be threatened. Due to the detailed and specific nature of this forecast product, it is imperative that the user provide the forecaster with necessary and sufficient information so that a reliable forecast can be prepared. .

Requests for spot forecasts should be made by using the web based spot forecast request form. This form along with instructions on how to use it are available on the fire weather page of the NWS Wilmington, NC web site (http://www.erh.noaa.gov/ilm). The web based spot forecast request form should be filled out as completely as possible by the user agency prior to submitting the request.

In times when internet access is hindered or not possible, spot forecasts may be requested and disseminated via fax or phone. If faxing a request, users should use the Fire Weather Special

Forecast Request Form, WS Form D-1 (Appendix F). Section I of WS Form D-1 should be filled out as completely as possible by the user agency prior to submitting the request by fax to the forecast office. If the request is made by phone, all the information in Section I should be provided to the forecast office.

While there is no dedicated fire weather forecaster, the forecast office will give a high priority to spot forecasts in the absence of weather phenomena in the CWFA that pose a threat to life and property. To ensure that the request for a spot forecast is handled properly and appropriately, users agencies should adhere to the following guidelines:

1) Allow adequate time for the forecaster to prepare the forecast. This will normally be between 20 and 30 minutes. On particularly busy fire weather days, spot forecasts will be handled on a first-come, first-served basis, with wildfires or other life threatening events taking the highest priority.

2) Provide as much on-site or near-site weather information as possible. At a minimum, the user must provide at least one observation within an hour of the request. This observation must contain the following: location of observation; elevation at the observation site; time of the observation; wind direction, speed, and level (eye or 20 foot); dry and wet bulb temperatures; any remarks about the state of the weather, particularly anything that may affect fire behavior. If possible, include some observations from the previous day that might give the forecaster an indication of daily trends.

3) As much as possible, specify the time period for which the forecast is needed.

4) As much as possible, specify the weather elements of most importance for which a forecast is needed and/or critical values of these elements.

5) Provide a contact point name and phone number where the forecaster can call back, if necessary. (Also include a fax number for returning completed forecasts if the web based spot request form is not used).

6) In order to receive prompt attention for a fax request, please phone the office to let the forecaster know the request is on the way.

7) Land management personnel should contact NWS Wilmington, NC for a spot update if forecast conditions appear unrepresentative of the actual weather conditions.

Whenever possible, users should provide feedback, positive or negative, to the NWS office in Wilmington, NC on the performance of the spot forecast during or shortly after an event. This will assist forecasters in subsequent forecasts for the same or similar conditions.

III.B.3 National Fire Danger Rating System (NFDRS) Forecasts

NFDRS forecasts are issued once daily for NFDRS sites which have provided an NFDRS observation that same day. Presently, NFDRS forecasts are issued for NFDRS observation sites at

the following locations: the DOD site at Sunny Point Military Ocean Terminal; the Nature Conservancy site near Supply, NC; the North Carolina Forest Service site at Whiteville, NC; the North Carolina Forest Service site adjacent to Turnbull Creek at the Turnbull Educational State Forest; and the North Carolina Forest Service site at Back Island on the Holly Shelter Gamelands (see Appendix G for more details). National guidelines for the NFDRS program allow for the issuance of both point and trend forecasts for each site. However, until a climatology can be built up for the sites, only NFDRS point forecasts will be issued. Sample NFDRS forecasts are displayed in Appendix H.

III.B.3.a Issuance Time For NFDRS Forecasts

The NFDRS forecasts will be issued once daily by 2000 UTC provided an appropriate NFDRS observation has been received by the National Weather Service. Updates to NFDRS forecasts are not required.

III.B.3.b NFDRS Point Forecast Content

NFDRS Point Forecasts are a forecast for weather expected at 1800 UTC the following day. The format of Point Forecasts and a sample forecast are shown below.

FCST,IdIdIdIdIdId,YYMMDD,HH,WX,DB,RH,L,N,DDD,FF,,TX,TN,HX,HN,D1,D2,F
Sample - FCST,319701,020112,13,2,56,50,1,1,ENE,2,,67,34,82,46,0,0,N

A decoded list of the fields in the above sample follows below.

FCST - Indicates this is a point forecast
IdIdIdIdIdId (319701) - Site Identifier
YYMMDD,HH (040111,13) - Date and hour forecast is valid (Jan 11, 2004 1300 EST)
WX (2) - Forecast state of the weather code (Broken clouds)

0 - Clear	5 - Drizzle
1 - Scattered Clouds	6 - Rain
2 - Broken Clouds	7 - Snow
3 - Overcast	8 - Showers
4 - Fog	9 - Thunderstorms

DB (56) - Dry Bulb temperature (56 degrees F)
RH (50) - Relative Humidity (50%)
L (1) - Lightning Activity Level (LAL) 1300 today to midnight tonight (None)
N (1) - LAL midnight tonight to midnight tomorrow (None)

LAL Decoder

1 - No Thunderstorms
2 - Isolated Thunderstorms
3 - Widely Scattered Thunderstorms
4 - Scattered Thunderstorms
5 - Numerous Thunderstorms
6 - Same as 3 but dry (little or no rain reaching ground)

DDD (ENE) - Direction from which the wind will blow (east-northeast)
FF (2) - Wind Speed (2 MPH)
TX (67) - Expected maximum temperature through 1300 EST Jan 11 (67 degrees F)

TN (34) - Expected minimum temperature through 1300 EST Jan 11 (34 degrees F)
HX (82) - Expected maximum relative humidity through 1300 EST Jan 11 (82 percent)
HN (46) - Expected minimum relative humidity through 1300 EST Jan 11 (46 percent)
D1 (0) - Expected precipitation duration in hours from 1300 EST today to 0600 EST tomorrow (0 hours)
D2 (0) - Expected precipitation duration in hours from 0600 EST to 1300 EST tomorrow (0 hours)
F (N) - Wet fuels flag (No - indicates fuels are not expected to be moist from precipitation)

III.B.4 Fire Weather Statements, Watches, and Warnings

During periods in which critical fire weather conditions are expected or imminent, the NWS will issue statements, watches, and warnings to describe the level of urgency to the appropriate user agencies. These issuances will be coordinated with land management agencies.

III.B.4.a Definition of a Red Flag Event

A Red Flag Event occurs when critical weather conditions develop which could lead to extensive wildfire occurrences or to extreme fire behavior. Red Flag Events represent a threat to life and property and may adversely impact fire fighting personnel and resources. Critical weather conditions include combinations of the following: strong, gusty winds; very low relative humidity; high to extreme fire danger; significant wind shifts; and lightning. Specific criteria can be found in Appendix I.

III.B.4.b Red Flag Warning

A Red Flag Warning will be issued, after coordination with the appropriate land management agencies, when a Red Flag Event is occurring or is imminent. The warning will be issued for all or a portion of the forecast area. It will be issued immediately once the forecaster and appropriate land management agency have determined that a Red Flag Event is ongoing. Otherwise, it shall be issued for impending Red Flag conditions when there is a high degree of confidence that conditions will develop within 24 hours. The warning will continue until the conditions cease to exist or fail to develop as forecast. At such time, the warning will be canceled. A sample Red Flag Warning and cancellation are in Appendix I.

III.B.4.c Fire Weather Watch

A Fire Weather Watch will be issued, after coordination with the appropriate land management agencies, to advise of the possible development of a Red Flag Event in the near future. It will be issued for all or part of the forecast area. A Fire Weather Watch is issued when the forecaster and appropriate land management agencies are reasonably confident that a Red Flag Event will occur. A watch should be issued 12 to 48 hours in advance but shall not be issued more than 72 hours in advance of the expected onset of critical weather conditions. The watch will remain in effect until

either it is determined the Red Flag Event will not develop or that the watch should be upgraded to a warning. If conditions are not expected to occur as forecast, the watch will be canceled. A sample fire weather watch and cancellation are in Appendix I.

III.B.4.d Fire Danger Statements and Blow-Up Alerts

When fire danger or fire occurrence is high and is coupled with critical weather conditions, user agencies may request that the NWS issue a Fire Danger Statement or Blow-Up Alert. These statements will be issued in coordination with the requesting agency and will only be issued with their approval.

III.C Communications

The primary means of communication used by the NWS is the Advanced Weather Interactive Processing System (AWIPS). Products transmitted by this means include pre-suppression forecasts, Fire Weather Watches, Red Flag Warnings, and Fire Danger Statements.

Spot forecasts will be disseminated only to the requesting agency by means of internet, or as a backup, telefax (FAX). Therefore, anytime a request for a spot forecast is made, the requesting agency must include a FAX number. A voice number should also be included in case problems are encountered with the fax transmission.

Other means of communication may be utilized upon mutual agreement with user agencies.

III.D Participation In Interagency Groups

The NWS and its customers will meet from time to time, for the purpose of reviewing the operational relationships agreed to in this plan, and as partners in other interagency meetings.

Meetings may be between one NWS office and all of its customers from several states, a state meeting of all NWS offices and fire weather customers within one state, or a meeting conducted by a customer group with the NWS offices invited either individually or collectively.

Customers may at times invite NWS representatives to serve on an interagency group on either the state or national level. The groups may serve a variety of purposes, such as program review, service evaluation, scientific advisory, or joint decision making.

III.E Special Fire Weather Services

Special fire weather services are those services that are uniquely required by land management agencies and go beyond the normal forecast operations of the NWS. Special services include Advanced Technology Meteorological Unit (ATMU), the All Hazards Meteorological Response System (AMRS), Incident Meteorologist (IMET) deployment, station visits, weather observer

training, participation in user agency training, and other pertinent meteorological services.

Typically, special services require NWS personnel to be away from the forecast office and, in some instances, be in overtime status. User agencies are responsible for covering the cost of NWS overtime, travel, and per diem expenses. Reimbursement of costs for special services will be as outlined in the Interagency Agreement for Meteorological Services.

III.E.1 Advanced Technology Meteorological Unit (ATMU) Services

The ATMU is a modular and mobile system of equipment used by an IMET for data collection and product preparation. ATMUs are a national resource with 25 of them being cached around the country, mainly in the western states. The nearest ATMU cache to WFO Wilmington is London, Kentucky where two are maintained.

An ATMU consists of two (2) modules. The first module contains a theodolite with tripod, a belt weather kit, PIBAL weather balloons, a nozzle and regulator for a helium tank, and office supplies and miscellaneous expendables. Its volume is 13.8 cubic feet and it weighs 122 pounds. The second module, known as the AMRS, contains a laptop computer with a satellite dish for obtaining weather data and a printer. This module is also a national resource, but is located at the National Weather Service stations that have an IMET on station. The volume of the satellite dish is 13.8 cubic feet and it weighs 122 pounds.

Requests for the ATMU, AMRS, and IMET should be made through the USDA Forest Service Region 8 Dispatch. The Meteorologist-in-Charge or the Fire Weather Program Leader at WFO Wilmington should also be notified of the request. Typically, the IMET nearest the incident will be deployed (WFO Wilmington does not have an IMET assigned to the station so it would be an IMET from a nearby office). However, during times of limited resources, IMETs from other areas of the country may be called. The decision will be made by the Special Meteorologist to NIFC (SMN) in conjunction with the MIC and IMET from the affected offices.

The mobilization on the ATMU, AMRS, and the IMET is coordinated through the Southern Area Interagency Coordination Center, the Southern Area Interagency Fire Cache, and the Interagency State Coordination Center. Demobilization is coordinated at the incident. For more specific information, reference the Southern Area and National Interagency Mobilization Guides.

The requesting agency is responsible for any storage of the unit while in transit, and shelter for the IMET and unit at the site. A sheltered work area, at least 50 square feet in area with a table and chair must be provided. The work area must be protected from excessive dust, free of standing water or condensation, and must be heated and /or cooled sufficiently to allow efficient operation of equipment. Power (120 V AC) is required for the ATMU's electrical equipment and priority telephone access during certain short periods each day must be made available.

Upon arrival at the incident and after going through the appropriate check-in procedures, the IMET will:

1. Brief the Fire Behavior Analyst (FBAN), Planning Section Chief (PSC), and the Incident Commander (IC) on current and expected weather as it affects the fire.

2. Establish a schedule with the IC and FBAN for written forecasts and formal briefings.

3. Request a briefing of the fire situation and potential behavior problems from the FBAN. As time and resources permit, incident management should arrange for an areal inspection trip of the fire by the IMET and should provide the forecaster with current fireline maps. If possible, the IMET should be assigned a radio with a fireline frequency.

4. In cooperation with the FBAN and PSC, arrange for a schedule of observations from key points around the fire and from nearby lookouts and fire danger stations. On large fires, some personnel (at least two) should be permanently assigned this duty. On smaller fires, this information can be provided by Division Supervisors equipped with belt weather kits.

III.E.2 Other Special Services

Other special services include weather station visits by user agency personnel, weather observer training, and course development work. These activities would typically be at the full expense of the requesting agency unless other arrangements have been made.

III.F Fire Weather Training

NWS meteorologists will be available to assist in user-oriented training, such as fire behavior training (eg, S-290), and other weather related courses. Requests should be made through the Meteorologist-in-Charge as early as possible after dates for such training have been determined.

IV. WILDLAND FIRE AGENCY RESPONSIBILITIES

IV.A. Operational Support and Predictive Services

IV.A.1 Program Management

The wildland fire agencies will oversee the fire weather observation program, including the siting and maintenance of the observing equipment, fire weather training of their personnel, and the proficiency of their personnel in the use of the NWS Spot software.

IV.A.2 Monitoring, Feedback and Improvement

Land management agencies will monitor the quality and timeliness of NWS fire weather products, and provide feedback to the NWS in order to improve services to the agencies.

IV.A.3 Technology Transfer

The wildland agencies may from time-to-time advise the NWS of new technologies being

implemented to monitor meteorological or fuel parameters, or improve communication, coordination, training, or reference. Wildland fire agency personnel may, with prior arrangement, visit an NWS office to acquite a knowledge of NWS technologies used in the monitoring of weather, or the preparation of products.

IV.A.4 Agency Computer Systems

Internet will be the primary method of obtaining the Fire Weather Forecast, Red Flag Warning, Fire Weather Watch, and for both requesting and receiving a Spot Forecast. As a backup method, a request can be made to the NWS for a product to be faxed to the customer agency. NFDRS observations will be entered into WIMS, and forecasts and calculations based on these observations will be received by WIMS, or by internet via a WIMS website.

IV.A.5. Fire Weather Observation Stations

Fire weather observation stations provide the specialized weather observations for fire weather forecasts, wildfire control and suppression, and various other land management operations. These stations were selected very carefully in each state and federal district. Sites were chosen to represent homogeneous conditions across a district. Stations may either be manned sites operated by land management agencies or unmanned Remote Automatic Weather Stations (RAWS), maintained by any of the federal or state land management agencies in the area.

All observation stations are assigned a 6-digit identification/location number. The first two digits indicate the state, the second two digits indicate the county, and the last two digits indicate the consecutively assigned station number for that county. Land managers who wish to have a number assigned to a station should contact the GACC meteorologist at SACC in Atlanta.

RAWS stations are also assigned an 8-character alphanumeric identifier based on satellite transmission time (the DCP number, issued by the National Environmental Satellite Service (NESS)).

Observations from a satellite telemetered RAWS site will automatically flow into WIMS via the NESDIS ID. Observations are only entered manually if the RAWS is neither satellite telemetered, nor a participant on the WIMS hub. The RAWS owner must enter WIMS and manually change a recorded observation (an R ob) to an observed observation (an O ob), manually enter the state of the weather, and save the observation to WIMS.

It is the responsibility of the RAWS (station) owner to ensure that observations are transmitted, recorded, and archived in WIMS. While the process is largely automated by the use of telemetry equipment on the RAWS station, there are still manual inputs that must be made in WIMS in a timely manner by the station owner to ensure that RAWS observations flow to the NWS on schedule. NFDRS forecasts are based on RAWS observations that are received from a collective created by WIMS and distributed to the NWS via AWIPS.

Every effort should be made to ensure the quality of the observations before entry into WIMS. If the observation is known to be in error, it should not be entered into the system, or should be corrected

by the RAWS owner.

IV.A.5.a Fire Weather Observation Quality Control

The fire weather program is a cooperative effort between the NWS and land management agencies. Accurate and timely weather information is one of the most important tools available to the land manager. Observations are the most important single effort that the control agencies put into the fire weather program. The observations entered into WIMS are direct input for the NFDRS output.

Observers should keep in mind that the weather observations they are taking are as much for their own use as for use by the NWS. For this reason, it is very important that fire weather observers be adequately trained to provide consistently timely and representative observations. Every effort should be made to ensure the quality of the observations before entry into WIMS. If an observation is known to be in error, it should not be entered into the system.

IV.A.6 Training Personnel and Maintaining Sites

The responsibility for training observers is with the user agencies. However, the NWS will be available to assist when requested to do so. Any expenses incurred by the NWS will normally be charged to the user agency, unless other arrangements have been made.

The user agencies are also responsible for maintaining observation site equipment. NWS personnel may accompany the user on maintenance trips or for annual inspection visits which could also serve as liaison with the users.

IV.A.7 Supplies

Most items for taking and recording observations will be furnished by the user agency. The NWS will furnish a few select forms and/or charts upon request.

V. JOINT RESPONSIBILITIES

V.A Meetings Between the NWS Offices and the Land Management Agencies

At least one statewide meeting is normally attempted each year, usually coordinated by the NWS North Carolina State Liaison Office in Raleigh. Individual NWS offices normally conduct a meeting with all of their customers, from all affected states, either each year or every other year.

V.B Maintenance and Revision of the Fire Weather Annual Operating Plan

The AOP should be revised each year by the end of January, with cooperation and participation from the NWS and land management agencies.

V.C Agreements on Services Provided

Agreements are normally reached at statewide meetings, but may be achieved at by a series of local meetings or by other means such as telephone or e-mail. NWS offices and land mangers should be aware of the ripple effect an agreement might have on other NWS offices or customers.

V.D Training

Land management agencies and the NWS collaborate on training of personnel in each others fields of expertise, operations and equipment. Visits to offices and work centers, as well field job sites can meet part of these training requirements.

V.E Service Evaluation

Services provided by the NWS, and delivery of observations and information from the land management agencies to the NWS in support of these services, shall be under constant evaluation by both parties.

V.F Numbering and Archiving of Observation Stations

The GACC, when requested to do so by a land management agency, shall assign a station ID number for fire weather obervation platforms.

The land management agency will provide the station name, location (county, latitude, and longitude), and elevation to the GACC meteorologist.

The GACC meteorologist will assign the number and assist the station owner in establishing a station catalog in WIMS.

The GACC meteorologist is responsible for maintaining a database of RAWS stations in his area. This information can be provided to the NWS regional program manager upon request.

VI. EFFECTIVE DATES OF THE ANNUAL OPERATING PLAN

This Operating Plan will be effective through the calender year specified. It will be revised annually by January 31, or more frequently as operations warrant.

List of Appendices

APPENDIX A

Interagency Agreement
for
Meteorological Services

Among the
Bureau of Land Management
Bureau of Indian Affairs
U.S. Fish and wildlife Service
National Park Service
of the United States Department of Interior
and the
Forest Service
of the United States Department of Agriculture'

and the

National Weather Service
of the
United States Department of commerce

BLM Agreement No. 1422RAI02-0030
BIA Agreement
FWS Agreement
FS Agreement No. 02-1A11130206041
NPS Agreement
NWS Agreement No. 201-02-002

The interagency agreement is 18 pages long and can be found on the Internet at the following address:

http://www.nws.noaa.gov/directives/010/pd01004006a.pdf

APPENDIX B

Organizational Contacts

National Weather Service Headquarters

David Billingsley
NWS Fire Weather Program Leader (W/OS2)
3833 S. Development Ave.
Boise, ID 83705-5354

National Weather Service Eastern Region Headquarters

Harvey Thurm
NWS Eastern Region Fire Weather Program Leader (W/ER1x4)
Airport Corporate Center
630 Johnson Avenue
Bohemia, NY 11716-2626

National Interagency Fire Center (NIFC)

Larry Van Bussum
Staff Meteorologist to NIFC
NWS Boise
3833 S. Development Avenue
Boise, ID 83705-5354

NWS Forecast Offices

Stephen C. Wilkinson
Fire Weather Program Leader
NWS Charleston
5777 South Aviation Avenue
Charleston, SC 29406

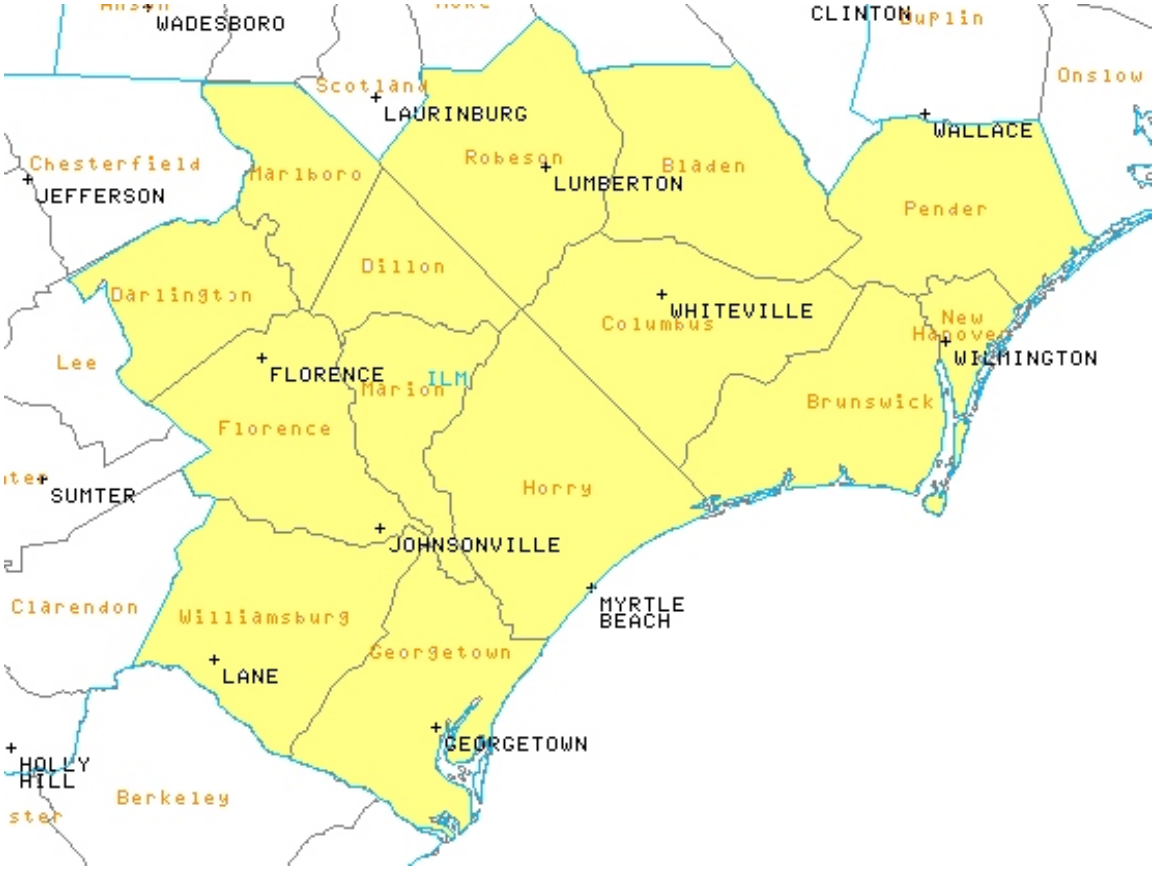
Jim Merrell
Fire Weather Program Leader
NWS Newport
53 Roberts Road
Newport, NC 28570

Bruce Cherry
Fire Weather Program Leader
NWS Columbia
2909 Aviation Way
West Columbia, SC 29210-2102

Phil Badgett
Fire Weather Program Leader
NWS Raleigh
1005 Capability Drive, Suite 300
Raleigh, NC 27606

APPENDIX C

Map of the NWS ILM Forecast Area



APPENDIX D

SAMPLE MORNING PRE-SUPPRESSION FORECAST

```
FNUS52 KILM 081322 AAA
FWFILM

FIRE WEATHER FORECAST...UPDATED
NATIONAL WEATHER SERVICE WILMINGTON NC
816 AM EST SUN FEB 8 2004

.DISCUSSION...
HIGH PRESSURE OVER THE AREA WILL MOVE OFF THE COAST TONIGHT.
A WEAK COASTAL TROUGH WILL MOVE INTO THE AREA MONDAY...AND
WILL CONTINUE UP THE COAST MONDAY NIGHT. WEAK LOW PRESSURE
WILL DEVELOP OVER THE GULF STATES TUESDAY...SPREADING MOISTURE
OVER THE AREA. A WEAK COLD FRONT WILL CROSS THE AREA TUESDAY
NIGHT...WITH HIGH PRESSURE GRADUALLY BUILDING INTO THE AREA
THURSDAY INTO THE WEEKEND.

NCZ097-100-101-SCZ034-046-082200-
BRUNSWICK-GEORGETOWN-HORRY-NEW HANOVER-PENDER-
INCLUDING THE CITIES OF...BURGAW...GEORGETOWN...MYRTLE BEACH...
SOUTHPORT...WILMINGTON...WRIGHTSVILLE BEACH
816 AM EST SUN FEB 8 2004

                      TODAY        TONIGHT      MON

CLOUD AMOUNT          CLR          MO CLR       MO CLDY
PRECIP CHC (%)        0            0            50
PRECIP TYPE           NONE         NONE         RAIN
MAX/MIN TEMP          50           30           56
20FT WINDS AM(MPH)    NW 14                     E  4
20FT WINDS AM(MPH)    N 10         NE  5        E  3
PRECIP AMOUNT         0.00         0.00         0.25
PRECIP DURATION       0            0            2
INVERSION             36/0900      1800         CONTINUED
HUMIDITY (%)          24           89           46
DSI                   3                         2
MIXING HGT            3200                      900
TRANSPORT WND (MPH)   N 15                      SE  8
VENTILATION RATE      48000                     7200
REMARKS...NONE.

$$

NCZ087-096-099-SCZ017-023-024-032-033-039-082200-
BLADEN-COLUMBUS-DARLINGTON-DILLON-FLORENCE-MARION-MARLBORO-ROBESON-
WILLIAMSBURG-
INCLUDING THE CITIES OF...BENNETTSVILLE...DARLINGTON...DILLON...
ELIZABETHTOWN...FLORENCE...KINGSTREE...LUMBERTON...MARION...
WHITEVILLE
816 AM EST SUN FEB 8 2004

                      TODAY        TONIGHT      MON

CLOUD AMOUNT          CLR          MO CLR       MO CLDY
PRECIP CHC (%)        0            0            20
PRECIP TYPE           NONE         NONE         RAIN
MAX/MIN TEMP          50           28           55
20FT WINDS AM(MPH)    NW 11                     E  3
20FT WINDS AM(MPH)    N  8         E  3         E  3
PRECIP AMOUNT         0.00         0.00         0.00
PRECIP DURATION       0            0            0
INVERSION             34/0900      1800         CONTINUED
HUMIDITY (%)          25           89           44
DSI                   3                         2
MIXING HGT            3300                      900
TRANSPORT WND (MPH)   NE 13                     SE  7
VENTILATION RATE      42900                     6300
REMARKS...NONE.

$$
```

APPENDIX D

.FORECAST FOR DAYS 3 THROUGH 7...

.MONDAY NIGHT...MOSTLY CLOUDY WITH A SLIGHT CHANCE OF RAIN. LOWS IN THE MID 40S.
.TUESDAY...CLOUDY WITH A CHANCE OF RAIN. HIGHS IN THE UPPER 50S.
.WEDNESDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. LOWS IN THE LOWER 40S. HIGHS IN THE MID 50S.
.THURSDAY...PARTLY CLOUDY WITH A CHANCE OF SHOWERS. LOWS IN THE UPPER 30S. HIGHS IN THE MID 50S.
.FRIDAY...PARTLY CLOUDY. LOWS IN THE MID 30S. HIGHS IN THE MID 50S.
.SATURDAY...PARTLY CLOUDY. LOWS IN THE MID 30S. HIGHS IN THE MID 50S.

.DAY 3 TO 5 WIND FORECAST...

.MONDAY NIGHT...WIND LESS THAN 15 MPH.
.TUESDAY...WIND LESS THAN 15 MPH.
.WEDNESDAY...WIND LESS THAN 15 MPH.
.THURSDAY...WIND LESS THAN 15 MPH.
.FRIDAY...WIND LESS THAN 15 MPH.

.OUTLOOK 8 TO 14 DAYS...SUNDAY FEBRUARY 15 TO SATURDAY FEBRUARY 21
TEMPERATURES... BELOW NORMAL.
PRECIPITATION... BELOW NORMAL.

$$

SC USERS		NC USERS
VENTILATION RATE	BURN CATEGORY	VENTILATION RATE
0 TO 17249	1	0 TO 33499
17250 TO 34499	2	33500 TO 44999
34500 TO 51749	3	45000 TO 59999
51750 TO 68999	4	60000 TO 111999
69000 OR GREATER	5	112000 OR GREATER

SC USERS		NC USERS
FORECAST SURFACE WIND	DISPERSION	FORECAST SURFACE WIND
	STAGNANT	NEAR CALM
CALM	VERY POOR	2 TO 4 MPH
2 TO 5 MPH	POOR	5 TO 8 MPH
6 TO 8 MPH	FAIR	9 TO 12 MPH
9 TO 13 MPH	GOOD	GREATER THAN 12 MPH
14 MPH OR MORE	EXCELLENT	

$$

APPENDIX D

SAMPLE AFTERNOON PRE-SUPPRESSION FORECAST

FNUS52 KILM 092041
FWFILM

FIRE WEATHER FORECAST
NATIONAL WEATHER SERVICE WILMINGTON NC
300 PM EST MON FEB 9 2004

.DISCUSSION...
A WEAK COASTAL TROUGH WILL MOVE NORTH OF THE AREA TONIGHT. WEAK LOW PRESSURE WILL DEVELOP OVER THE GULF STATES TUESDAY AND MOVE UP ALONG THE SOUTHEAST COAST. A COLD FRONT WILL CROSS THE AREA TUESDAY NIGHT. ANOTHER AREA OF LOW PRESSURE WILL MOVE ALONG THE SOUTHEAST COAST WEDNESDAY NIGHT INTO THURSDAY. HIGH PRESSURE WILL BUILD ACROSS THE AREA FROM THE WEST FRIDAY THROUGH MONDAY.

NCZ097-100-101-SCZ034-046-082200-
BRUNSWICK-GEORGETOWN-HORRY-NEW HANOVER-PENDER-
INCLUDING THE CITIES OF...BURGAW...GEORGETOWN...MYRTLE BEACH...
SOUTHPORT...WILMINGTON...WRIGHTSVILLE BEACH
300 PM EST MON FEB 9 2004

	TONIGHT	TUE	TUE NIGHT	WED
CLOUD AMOUNT	MO CLDY	MO CLDY	MO CLDY	PT CLDY
PRECIP CHC (%)	40	50	20	10
PRECIP TYPE	RAIN	RAIN	RAIN	NONE
MAX/MIN TEMP	43	56	40	57
20FT WINDS AM(MPH)		NW 5		N 10
20FT WINDS AM(MPH)	N 7	W 8	W 8	N 9
PRECIP AMOUNT	0.00	0.25	0.00	0.00
PRECIP DURATION	0	3	0	0
INVERSION	1700	49/1000	1800	49/1000
HUMIDITY (%)	96	59	100	37
DSI		1		2
MIXING HGT		2300		3700
TRANSPORT WND (MPH)		W 7		N 20
VENTILATION RATE		16100		74000

REMARKS...NONE.

$$

NCZ087-096-099-SCZ017-023-024-032-033-039-082200-
BLADEN-COLUMBUS-DARLINGTON-DILLON-FLORENCE-MARION-MARLBORO-ROBESON-
WILLIAMSBURG-
INCLUDING THE CITIES OF...BENNETTSVILLE...DARLINGTON...DILLON...
ELIZABETHTOWN...FLORENCE...KINGSTREE...LUMBERTON...MARION...
WHITEVILLE
300 PM EST MON FEB 9 2004

	TONIGHT	TUE	TUE NIGHT	WED
CLOUD AMOUNT	MO CLDY	MO CLDY	MO CLDY	PT CLDY
PRECIP CHC (%)	20	40	20	10
PRECIP TYPE	RAIN	RAIN	RAIN	NONE
MAX/MIN TEMP	40	58	38	57
20FT WINDS AM(MPH)		NW 4		NW 8
20FT WINDS AM(MPH)	NW 4	W 6	W 7	N 7
PRECIP AMOUNT	0.00	0.00	0.00	0.00
PRECIP DURATION	0	0	0	0
INVERSION	1700	47/1000	1800	47/1000
HUMIDITY (%)	96	51	100	36
DSI		1		2
MIXING HGT		2400		3700
TRANSPORT WND (MPH)		W 8		N 13
VENTILATION RATE		19200		48100

REMARKS...NONE.

$$

APPENDIX D

.FORECAST FOR DAYS 3 THROUGH 7...

.WEDNESDAY NIGHT...MOSTLY CLOUDY WITH A CHANCE OF RAIN. LOWS IN THE UPPER 30S.
.THURSDAY...MOSTLY CLOUDY WITH A CHANCE OF RAIN. HIGHS IN THE LOWER 50S.
.FRIDAY...PARTLY CLOUDY WITH A SLIGHT CHANCE OF RAIN. LOWS IN THE MID 30S. HIGHS IN THE MID 50S.
.SATURDAY...PARTLY CLOUDY. LOWS IN THE UPPER 30S. HIGHS IN THE UPPER 50S.
.SUNDAY...MOSTLY CLEAR. LOWS IN THE UPPER 30S. HIGHS IN THE UPPER 50S.
.PRESIDENTS DAY...PARTLY CLOUDY. LOWS IN THE UPPER 30S. HIGHS IN THE UPPER 50S.

.DAY 3 TO 5 WIND FORECAST...

.WEDNESDAY NIGHT...WIND LESS THAN 15 MPH.
.THURSDAY...NORTHEAST WINDS AROUND 15 MPH.
.FRIDAY...WIND LESS THAN 15 MPH.
.SATURDAY...WIND LESS THAN 15 MPH.
.SUNDAY...SOUTHWEST WINDS AROUND 15 MPH SHIFTING TO THE NORTH AROUND 15 TO 20 MPH.

.OUTLOOK 8 TO 14 DAYS...TUESDAY FEBRUARY 17 TO MONDAY FEBRUARY 23
TEMPERATURES... BELOW NORMAL.
PRECIPITATION... BELOW NORMAL.

$$

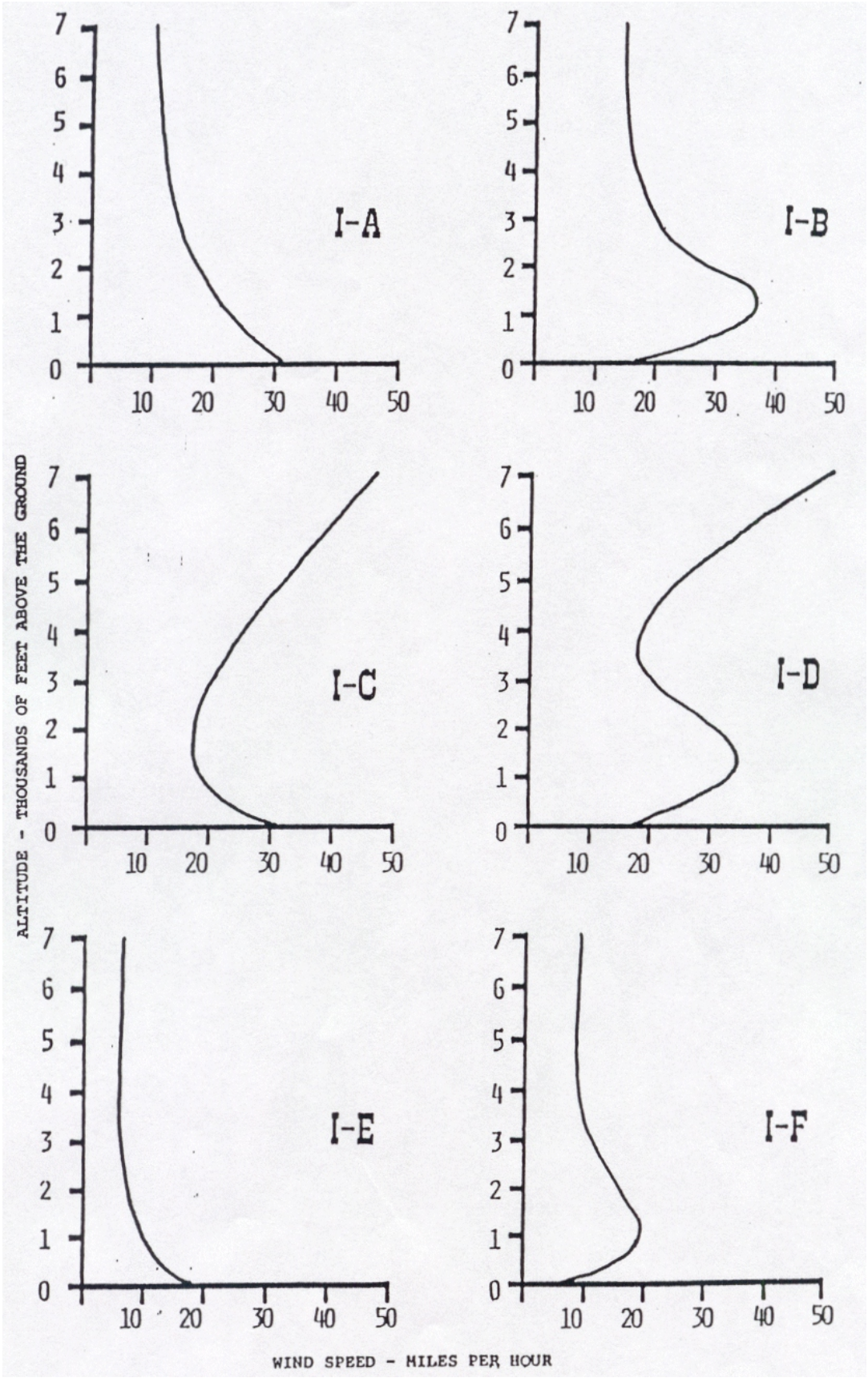
SC USERS		NC USERS
VENTILATION RATE	BURN CATEGORY	VENTILATION RATE
0 TO 17249	1	0 TO 33499
17250 TO 34499	2	33500 TO 44999
34500 TO 51749	3	45000 TO 59999
51750 TO 68999	4	60000 TO 111999
69000 OR GREATER	5	112000 OR GREATER

SC USERS		NC USERS
FORECAST SURFACE WIND	DISPERSION	FORECAST SURFACE WIND
	STAGNANT	NEAR CALM
CALM	VERY POOR	2 TO 4 MPH
2 TO 5 MPH	POOR	5 TO 8 MPH
6 TO 8 MPH	FAIR	9 TO 12 MPH
9 TO 13 MPH	GOOD	GREATER THAN 12 MPH
14 MPH OR MORE	EXCELLENT	

$$

APPENDIX E

KEY TO ADVERSE WIND PROFILES



APPENDIX F

Spot Forecast Request Form D-1

See the last page of this document for a copy of Form D-1 which can be photocopied for operational use.

APPENDIX G

Catalog of Fire Weather Observation Sites in Southeast North Carolina

Name, County, Station Number, Latitude, Longitude, Elevation

Back Island, Pender County, 319402, 34.5328 N, 77.7219 W, 20'

Nature Conservancy, Brunswick County, 319802, 34.0483 N, 78.2903 W, 56'

Sunny Point, Brunswick County, 319803, 34.0028 N, 77.9581 W, 30'

Turnbull Creek, Bladen County, 319302, 34.6831 N, 78.5817 W, 98'

Whiteville, Columbus County, 319701, 34.336 N, 78.7286 W, 98'

APPENDIX H

SAMPLE NATIONAL FIRE DANGER RATING SYSTEM (NFDRS) POINT FORECASTS

```
FCST,319701,021015,13,6,67,90,1,1,E,15,,67,55,100,67,1,5,Y
FCST,319301,021015,13,6,67,90,1,1,ENE,15,,67,55,100,67,1,5,Y
FCST,319803,021015,13,6,70,93,1,1,E,15,,72,59,100,69,2,4,Y
FCST,319802,021015,13,6,69,94,1,1,E,15,,71,57,100,67,2,4,Y
```

APPENDIX I

NWS Red Flag Criteria

At least two of the following must be occurring or be forecast to occur:

1. Sustained surface wind of 20 mph or greater for a significant duration during the forecast period (roughly 6 hours or more).

2. Significant wind shift (front, sea breeze, etc.) during a period of active fire suppression efforts.

3. Minimum relative humidity of 25 percent or lower.

4. Strong potential for lightning, especially after an extended hot and dry period or when dry lightning (little or no rain) is expected.

Since many combinations of weather and fuel conditions can lead to a Red Flag Event, these criteria serve merely as guidelines with which a forecaster can assess the meteorological conditions which might lead to extensive wildfire occurrences or to extreme fire behavior. Therefore, the fire weather forecaster will ALWAYS coordinate with the appropriate land management officials before issuing a Fire Weather Watch or Red Flag Warning. Coordination calls should include discussion of fuel moisture, KBDI's, seasonal concerns, and current fire suppression efforts.

SAMPLE RED FLAG WARNING

```
TTAA00 KILM DDHHMM
RFWILM

RED FLAG WARNING
NATIONAL WEATHER SERVICE WILMINGTON NC
830 AM EST THU NOV 13 2003

NCZ087-096-097-099>101-SCZ017-023-024-032>034-039-046-DDHHMM-

...RED FLAG WARNING TODAY...

FIRE WEATHER ZONES (OR COUNTIES) INCLUDED IN THIS WARNING ARE:

IN NORTH CAROLINA:
  BLADEN          BRUNSWICK       COLUMBUS        NEW HANOVER
  PENDER          ROBESON

IN SOUTH CAROLINA:
  DARLINGTON      DILLON          FLORENCE        GEORGETOWN
  HORRY           MARION          MARLBORO        WILLIAMSBURG

A COLD FRONT WILL MOVE ACROSS THE CAROLINAS RESULTING IN A DRY AND GUSTY WESTERLY FLOW TODAY. WEST
WINDS WILL RANGE FROM 15 TO 25 MPH TODAY WITH GUSTS IN EXCESS OF 30 MPH POSSIBLE. THE RELATIVE
HUMIDITY WILL DROP DURING THE LATE MORNING INTO THE AFTERNOON TO AROUND 20 PERCENT. COMBINED WITH LOW
FUEL MOISTURE AND MODERATE DROUGHT CONDITIONS...THIS WILL LEAD TO A SITUATION MORE FAVORABLE FOR
WILDFIRES AND BRUSHFIRES TO OCCUR. THE WINDS WILL GRADUALLY DIMINISH TONIGHT.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS RED FLAG WARNING.
$$
```

SAMPLE RED FLAG WARNING CANCELLATION

```
TTAA00 KILM DDHHMM
RFWILM

RED FLAG WARNING CANCELLATION
NATIONAL WEATHER SERVICE WILMINGTON NC
500 PM EST THU NOV 13 2003

NCZ087-096-097-099>101-SCZ017-023-024-032>034-039-046-DDHHMM-

...RED FLAG WARNING CANCELLED...

FIRE WEATHER ZONES (OR COUNTIES) INCLUDED IN THIS CANCELLATION ARE:

IN NORTH CAROLINA:
  BLADEN          BRUNSWICK       COLUMBUS        NEW HANOVER
  PENDER          ROBESON

IN SOUTH CAROLINA:
  DARLINGTON      DILLON          FLORENCE        GEORGETOWN
  HORRY           MARION          MARLBORO        WILLIAMSBURG

WINDS HAVE DIMINISHED LATE THIS AFTERNOON TO AROUND 15 MPH AND WILL BECOME NORTH AT 5 TO 10 MPH THIS
EVENING. RELATIVE HUMIDITY VALUES WILL SLOWLY RECOVER TO AROUND 40 PERCENT BY MIDNIGHT. AS A
RESULT...THE RED FLAG WARNING WHICH WAS IN EFFECT FOR SOUTHEAST NORTH CAROLINA AND NORTHEAST SOUTH
CAROLINA HAS BEEN CANCELLED.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS RED FLAG WARNING
CANCELLATION.
$$
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SAMPLE FIRE WEATHER WATCH

```
TTAA00 KILM DDHHMM
RFWILM

FIRE WEATHER WATCH
NATIONAL WEATHER SERVICE WILMINGTON NC
335 PM EST WED FEB 11 2004

NCZ087-096-097-099>101-SCZ017-023-024-032>034-039-046-DDHHMM-

...FIRE WEATHER WATCH FOR THURSDAY...

FIRE WEATHER ZONES (OR COUNTIES) INCLUDED IN THIS WARNING ARE:

IN NORTH CAROLINA:
  BLADEN          BRUNSWICK       COLUMBUS        NEW HANOVER
  PENDER          ROBESON

IN SOUTH CAROLINA:
  DARLINGTON      DILLON          FLORENCE        GEORGETOWN
  HORRY           MARION          MARLBORO        WILLIAMSBURG

A STRONG COLD FRONT IS EXPECTED TO MOVE INTO THE CAROLINAS FROM THE NORTHWEST ON THURSDAY.  STRONG
WEST WINDS AND LOW HUMIDITIES ARE EXPECTED BEHIND THE FRONT THURSDAY AFTERNOON.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS FIRE WEATHER WATCH.
$$
```

APPENDIX I

SAMPLE FIRE WEATHER WATCH CANCELLATION

```
TTAA00 KILM DDHHMM
RFWILM

FIRE WEATHER WATCH CANCELLATION
NATIONAL WEATHER SERVICE WILMINGTON NC
830 AM EST THU FEB 12 2004

NCZ087-096-097-099>101-SCZ017-023-024-032>034-039-046-DDHHMM-

...FIRE WEATHER WATCH CANCELLED...

FIRE WEATHER ZONES (OR COUNTIES) INCLUDED IN THIS CANCELLATION ARE:

IN NORTH CAROLINA:
  BLADEN          BRUNSWICK       COLUMBUS        NEW HANOVER
  PENDER          ROBESON

IN SOUTH CAROLINA:
  DARLINGTON      DILLON          FLORENCE        GEORGETOWN
  HORRY           MARION          MARLBORO        WILLIAMSBURG

A STRONG COLD FRONT IS EXPECTED TO MOVE INTO THE CAROLINAS FROM THE NORTHWEST THIS AFTERNOON.  WHILE
WINDS MAY GUST TO 25 MPH BEHIND THE COLD FRONT...RELATIVE HUMIDITY VALUES WILL REMAIN ABOVE 25
PERCENT.

PLEASE ADVISE THE APPROPRIATE OFFICIALS OR FIRE CREWS IN THE FIELD OF THIS FIRE WEATHER WATCH
CANCELLATION.
$$
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Signatory Page

The following signatories have agreed to the terms and conditions of this Annual Operating Plan, which is subject to revision on a least an annual basis, or more frequently as operations necessitate. Actual signatures are maintained on file.

/signed/ 2/13/04

John A. Quagliariello Jr. Date
Fire Weather Program Leader
National Weather Service Wilmington, NC

/signed/ 2/13/04

David Jarman Date
Fire Chief
North Carolina Forest Service

/signed/ 2/20/04

Ann Childress Date
Moores Creek National Battlefield
National Park Service

WS FORM D-1
(12-86)
Pres. By WSOM D-41

FIRE WEATHER SPECIAL FORECAST REQUEST

(See reverse for instructions)

U. S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL WEATHER SERVICE

I - REQUESTING AGENCY WILL FURNISH:

1. NAME OF FIRE OR OTHER PROJECT	2. CONTROL AGENCY	3. REQUEST MADE	
		TIME+	DATE

4. LOCATION (by 1/4Sec-Sec_Twp-Range)	5. DRAINAGE NAME	6. EXPOSURE (NE,E,SE,etc.)

7. SIZE OF PROJECT (Acres)*	8. ELEVATION*		9. FUEL TYPE	10. PROJECTION ON:
	TOP	BOTTOM		☐ GROUND ☐ CROWNING

11. **WEATHER CONDITIONS AT PROJECT OR FROM NEARBY STATIONS** (See Example on reverse)

PLACE	ELE-VATION	OB TIME+	WIND DIR. - VEL.		TEMP.		++(Lv.Blank)		REMARKS (Indicate rain, thunderstorms, etc. Also wind condition and 10ths of cloud cover)
			20 FT	EYE LEVEL	DRY	WET	RH	DP	

12. **SEND FORECAST TO:**	PLACE	VIA : FAX PHONE	ATTN: (Name, if applicable)

II. FIRE WEATHER FORECASTER WILL FURNISH:

13. FORECAST AND OUTLOOK:
(Specify Wind - 20 foot or Eye Level)

TIME+ AND DATE:

NAME OF FIRE WEATHER FORECASTER	FIRE WEATHER OFFICE WILMINGTON, NC

III - REQUESTING AGENCY WILL COMPLETE UPON RECEIPT OF FORECAST

IV - FORECAST RECEIVED:	TIME +	DATE	NAME

EXPLANATION OF SYMBOLS

+ Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215 a.m. = 1015
* For concentrations (as groups of lightning fires) specify "concentration"; then give number of fires and size of largest. If concentrations are in more than one drainage, request special forecast for each drainge.
++No entry necessary. To be computed by Fire Weather Forecaster